Nortel, the sample represents Verizon's commitment to purchase over **[BEGIN VERIZON PROPRIETARY]** **[END VERIZON PROPRIETARY]** worth of switching equipment over the three life years of the contract. Verizon has estimated it will spend a similar amount in 2001 **[BEGIN VERIZON PROPRIETARY** **[END VERIZON PROPRIETARY]** for Lucent equipment and **[BEGIN VERIZON PROPRIETARY]** **[END VERIZON PROPRIETARY]** for Nortel equipment).

Verizon MA's use of 2000 data is appropriate, reflecting a reasonable mix of new and replacement switch discounts, and is an accurate predictor of forward-looking costs. In fact, the use of 2000 data is conservative considering that at the present time Verizon's current plans include the purchase of only one new digital end-office stand-alone and/or host switch in 2001.[18/]

C. Trunk Utilization

Q. AT&T/WorldCom claim (Pitts at 24) that Verizon MA's study assumes "substantial under utilization of trunk port capacity." Can you comment on their claim?

Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma, CC Docket No. 00-217, FCC 01-29, ¶ 77 (rel. Jan. 22, 2001)

[18] Charleston, WV.

A. Yes. Ms. Pitts' comments are premised upon the assertion that Verizon MA uses its trunking network solely for Verizon MA traffic, and that if Verizon MA were more efficient, it would design its trunks to carry more traffic than indicated in the study. Verizon MA however does not design and build each of its trunks only for its own use. In the current environment, and the foreseeable future, a large portion of Verizon MA's trunks are used by other carriers as interconnection trunks (both for local and long distance). In fact, as of November 1, 2001, approximately 62%[19] of Verizon MA's trunks are used for interconnection to carriers and CLECs. Verizon MA has no control over how much traffic the carriers/CLECs choose to send over these trunks. Yet, Ms. Pitts suggests that Verizon can compel the carriers to be "more efficient" with the use of these trunks. Verizon MA used actual trunk traffic usage data, adjusted upward, as the basis for developing the trunk costs. To suggest the use of anything different is the equivalent of requiring Verizon MA to subsidize the carriers for a less efficient use of the network.

Q. What effect does the low traffic usage on the carriers trunks have on the trunk cost studies?

A. Since Ms. Pitts discussion uses the *average* SCIS trunk CCS, she fails to mention that in many cases, the Verizon MA study includes trunks with a

[19] 418,000 CLEC trunks and 264,000 IEC and Wireless trunks.

CCS greater than the 20 CCS she proposes. It is clear that the carriers' trunks with the lower CCS, are causing the average to be driven downward.

Q. AT&T/WorldCom (Pitts at 25) also criticize Verizon MA for entering a 95% fill factor for trunks in SCIS and then utilization adjustment of 94.28% in the cost study spreadsheets. Can you comment on her criticisms?

A. Yes. Ms. Pitts implies that Verizon MA made two unjustified adjustments to the SCIS investment for trunks for utilization.

SCIS requires an input assumption for the administrative fill for trunks. This input pertains to the number of trunks utilized versus the number of spare trunks. In this case Verizon MA uses a conservative 95% fill assumption. This means that at any given time, 5% of the trunk ports are spare, with the remaining 95% utilized. Administrative spare is necessary for all components of the network in order to accommodate uncertainties such as customer inward outward movement, maintenance requirements, and the technical/physical nature of the design of the particular plant and equipment.

More spare trunks are required than administrative spare for forecast uncertainties, defective plant (defective switch equipment), random fluctuations in demand, future growth, and other factors. Verizon MA uses a conservative 90% average trunk utilization, which includes administrative spare. Since SCIS already takes into consideration the 95% administrative spare, the 90% is adjusted upwards to account for this. In addition, the

average utilization is adjusted upwards again to account for equipment breakage in SCIS, to arrive a very conservative 116.90%[20] overall end office trunk utilization.

Q. What is Verizon's MA's actual digital trunk utilization?

A. As of November 1, 2001 trunk utilization is approximately 76.6%.

D. Percent of IDLC

Q. AT&T/WorldCom claims (Pitts at 26) that Verizon MA should use a higher percentage of its lines on integrated digital loop carrier (IDLC) than the 25% that was used in the study. Can you comment on this claim?

A. Yes. In fact, as discussed above, the 25% IDLC, provisioned on GR-303 interfaces in the switch is extremely conservative.

Q. On page 27, AT&T/WorldCom make the statement that "the only UNE line-side switch ports that will be purchased by competitive carriers will be those associated with UNE-P." Yet, they argue that the amount of IDLC used to develop Verizon MA's switch costs should be almost 50% of all lines. What affect would using this kind of percentage of IDLC have on Verizon MA's costs?

A. Using such a high percentage of IDLC would cause Verizon MA to grossly understate its forward looking switching and loop costs thereby resulting in a substantial under recovery of its forward looking costs of providing UNEs.

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[20] *See* Revised Workpaper, Part C-1, Section 38, Page 4.

As of December 1, 2001, Verizon MA's current network only has 14% of its lines working on IDLC in the switch and that such dramatic deployment of IDLC is not anticipated even in the a forward looking environment. Attempting to estimate forward looking switching costs on such an unrealistic assumption would result in Verizon MA subsidizing AT&T/WorldCom each time they purchase a switch related UNE. Verizon MA's aggressive 25% is a more than reasonable forward looking estimate and should be used as the basis to develop the switching costs.

E. Feature Inputs

Q. AT&T/WorldCom (Pitts at 29) allege that there is a lack of support for various SCIS inputs used to develop the feature port additives, some of which affect the feature costs significantly. Can you comment on this?

A. The SCIS/IN inputs require estimating usage characteristics by customer of each feature. The majority of the usage characteristics of features do not affect the cost dramatically. More importantly, the feature usage assumptions relied upon by Verizon are reasonable and are based primarily on the judgment of a product manager with over 25 years experience. Verizon's product manager is familiar with actual customer feature usage and sufficiently knowledgeable to develop reasonable feature usage input assumptions. Furthermore, Verizon believes that all the various feature inputs used fall within reasonable ranges. AT&T/WorldCom offer no evidence that Verizon's inputs do not represent

actual feature usage characteristics associated with Massachusetts end users.

Q. AT&T/WorldCom also point out (Pitts at 30) that changing an input regarding the usage of a feature in the busy hour from 0.25 CCS to 0.5 CCS doubles the feature cost. Is that true?

A. This is not true for most of the costs for the switch features filed by Verizon, since they require hardware that is not dependent on feature usage. However, there are exceptions, such as Centrex Intercom. It may be true that doubling the busy hour CCS input for that feature will double the costs. However, the relevant inquiry here is whether the cost results are reasonable. Using Centrex Intercom as an example, an input of 0.5 Busy Hour CCS per line translates to a customer making an intercom call once during the busy hour (per day) for a duration of 50 seconds. Or it could translate into a customer making a total of two 25 second calls during the busy hour (per day). AT&T/WorldCom portrays this input as being unreasonable; however, when it is translated into real feature usage, the value is highly conservative.

F. Verizon MA Accurately Allocated Switching Costs According To Traffic Sensitivity

Q. Please explain how Verizon MA determined which costs were traffic-sensitive and which costs were non-traffic-sensitive.

A. Verizon MA has assigned the following SCIS investments to the ports: Line Termination A+B+D; Trunk CCS; BRI -- U Card; PRI D Channel; and PRI B

Channel. All other SCIS identified switching investments are considered usage-related and have been assigned appropriately to usage.

Q. Please respond to AT&T/WorldCom's statement that "digital switches are port limited, not call or minute-of-use capacity constrained." (Pitts at 31).

A. Verizon MA demonstrates in the surrebuttal testimony of Telcordia witness David Garfield that port exhaustion is only one factor that contributes to switch capacity. Usage, however, is by far the largest driver of switch capacity.

Q. Do AT&T/WorldCom properly define traffic sensitive and non-traffic sensitive costs?

A. No. AT&T/WorldCom's notion that only variable costs should be assigned to usage while fixed costs should be assigned to ports is incorrect. The proper question to ask when assigning costs between usage and the port is: What switch resources are dedicated to one user, and what resources are shared among all users? Dedicated resources should be recovered by the particular user dedicated to that resource (such as a port or trunk). Shared resources should be recovered by each user sharing those resources in a fair and reasonable manner (such as a per-minute-of-use charge).

Q. Do Verizon MA's cost studies correctly allocate switch resources in that manner?

A. Yes. Verizon MA utilizes the Telcordia-developed model SCIS to ensure that investments (switch resources) are accurately and appropriately identified. Unit investment associated with the port (both trunk and line) is identified by SCIS in the manner described in this panel's direct testimony. All other SCIS-identified investments are considered shared and are assigned to usage.

Q. Do you agree with AT&T/WorldCom's claim that "getting started" costs do not vary according to the line and traffic inputs into SCIS, and that "getting started" costs are not traffic-sensitive? (Pitts at 32).

A. No. As Mr. Garfield explains in his surrebuttal testimony, "getting started" costs are driven by usage and should therefore be recovered on a usage basis.

Q. Do you agree that BRI and PRI costs should be categorized as non-traffic-sensitive? (Pitts at 33).

A. Yes, as recognized in our study BRI and PRI port costs should be categorized as non-traffic-sensitive, because they are dedicated to single end users.

Q. Do you agree that other ISDN-related port costs should be categorized as non-traffic-sensitive? (Pitts at 34).

A. Yes, as recognized in our study, ISDN-related port costs should be categorized as non-traffic-sensitive because these resources are not shared among end users.

Q. Do you agree that EPHC costs should be assigned to the ports? (Pitts at 33-34).

A. No. As explained in the surrebuttal testimony of Mr. Garfield, EPHC costs are usage sensitive, and Verizon MA properly treated them as such in its analysis.

Q. Do you agree with AT&T/WorldCom's claim that Line CCS categories, D Channel Access PPS, PPB Channel Access PPS, Inter-Switch PPS, and SS7 link costs should all be assigned to the traffic-sensitive category? (Pitts at 35).

A. Yes, and Verizon MA's cost studies appropriately assign these costs to usage.

Q. Do you agree with AT&T/WorldCom's claim that trunk costs are traffic-sensitive and should be assigned to the common trunk MOU rate element? (Pitts at 35).

A. Yes, Verizon MA believes that trunk costs are traffic-sensitive and must be recovered on an MOU basis.

Q. Please summarize the percentage of switching costs that Verizon MA has categorized as traffic-sensitive and non-traffic-sensitive.

A. Verizon MA's switching costs, as calculated in the switching cost studies, are 49.41% non-traffic-sensitive and 50.59% traffic-sensitive.[21]

[21] Revised Workpapers, Part C-2, Section 4, Page 1, Lines 23-25.

Q. Why is it important that the Department properly allocate traffic and non-traffic-sensitive costs?

A. From a cost recovery standpoint, AT&T/WorldCom's proposal to allocate most of the switching costs to the port rate element, regardless of how much of the switch resources (*i.e.*, usage) each customer utilizes, contradicts basic cost-causation principles and could artificially drive up the actual level of usage, resulting in an under-recovery of switching investments for Verizon and congestion in Verizon's switching network. Verizon is entitled to recover its costs, while the particular carrier may determine the type of customer behavior it wishes to encourage. Each carrier can establish rate structures that drive desired customer usage behavior. For example, charging customers for each minute they utilize the network results in usage behavior that takes into account the fact that network costs are related to levels of usage. Eliminating a usage charge would certainly have a negative impact on the network because it would not send the correct pricing signals to customers. This is exactly what occurred several years ago as when the Internet traffic increased. When Internet Service Providers (such as, America Online ("AOL")) initially offered unlimited monthly usage, many people logged on their computers in the morning and never logged off, for fear that they might not be able get back onto the network because of limited modem facilities (*i.e.*, busy

signals). It didn't take long for AOL to realize this and provide safeguards in their network to automatically log off users after ten minutes of inactivity. In addition, AT&T/WorldCom are proposing exactly what the Department has always taken much care to avoid -- having low-usage residential customers support high-usage business customers. Put simply, the cost causers should pay for the resources required by their demand.

Q. Can you give us an example of how Verizon MA could under recover its switching costs by shifting usage related cost into the port cost for UNEs?

A. For example, take an office that has a getting started (GS) cost of $100. Further assume that Verizon sells 10% of its lines and 20% of its usage to UNE-P based CLECs. If the GS cost in the UNE world is recovered through the port rate, Verizon we will recover 10% of the GS costs or $10 from the CLECs. On the retail side however GS costs are being recovered from usage. Therefore, Verizon will recover only $80 ($100 x (1-20%)) because Verizon will have lost 20% of usage to the CLECs. That leaves $10 that Verizon MA will never recover.

G. RTUs Have Been Substantiated

Q. AT&T/WorldCom assert (page 36) that the forward-looking annual cost that Verizon identified for digital switch RTU fees is unsubstantiated and includes software purchases necessary to "catch up" older switches with current software programs. Is this true?

A. Definitely not. Both switching vendors used by Verizon MA issue new generic releases of their software each and every year. In fact, Nortel issues two releases per year and Lucent one. Each release contains new software feature and operational/maintenance packages in addition to enhancements to previously deployed packages. The issue is thus not "catching up" but "keeping up." Again, AT&T/WorldCom are relying on a static costing construct that assumes that a telephone company can gear up to provide service only at a single instant in time. They ignore the fact that companies must continually invest in new software in order to be able to provide the latest services with the highest level of efficiency.

Q. Why did Verizon rely on using high level estimates for RTU annual costs instead of identifying each software package it purchases for switching?

A. In past proceedings, Verizon cost analysts attempted to identify in a fine grained fashion each software package associated with each type of feature in each type of switch, along with its associated cost. As a result of this process, Verizon cost analysts recognize that purchasing switch software is an annual ongoing process. Throughout the year, the Company's planners review and analyze the switching vendor's new releases of software packages to determine which packages best meet the ever changing regulatory, operational, and marketing environment. The rest is a budgeting exercise. Verizon designates a yearly amount it will spend on RTU and the planner determines the appropriate software

packages it will purchase with that budgeted amount. Verizon's cost study appropriately seeks to recover the annual amount it estimates it will incur for forward looking RTU fees.

Q. AT&T/WorldCom (page 36) claim that a one time "spike" in RTU expenditures in 1999 is unexplained, and therefor should not be included. Can you explain the "spike"?

A. The amortization of the RTU costs should properly include expenditures in 1999. On January 1, 1999, the Company implemented Statement of Position ("SOP") 98-1 from the American Institute of Certified Public Accountants. SOP 98-1 called for the capitalization rather than expensing of software and right-to-use fees. Importantly, it also changed the rules as to when certain expenditures would be realized on the books. Prior to the implementation of SOP 98-1, Software/RTU fees were expensed as they were deployed throughout the network – often over a several year period. With SOP 98-1, as soon as the software was tested and accepted, the entire amount was capitalized. As a result, Software/RTU expenditures that would have been spread over a several year period, were instead all realized in 1999. They therefore are properly included in the RTU analysis, since once the transition period is over, it is expected that the annual amount of RTU will settle at the estimated amount reflected in the Company's studies. Moreover, as explained in Verizon MA's direct testimony, the annual estimate of RTU is based on the estimated amount

Verizon MA will spend over a year on RTU for digital switching. Software expenditures can and do vary year over year, and there is no reason to disregard any actual spike in expenditures in any year. Certainly there may be vendor software developed in the near future that may cause another spike.

Verizon MA's methodology for estimating RTUs is extremely conservative, because the vast majority of Verizon MA's digital switching network is already deployed. The average cost per end office per year in Verizon MA's cost study does not capture the initial cost of the RTU incurred with the initial deployment of a digital switch. Although Verizon MA did not attempt to estimate the cost of the initial switch software packages, we know from previous UNE proceedings that it is approximately $2 million[22] *per switch*.

Q. Do you agree with AT&T/WorldCom claim that RTU fees should be recovered on a non-traffic-sensitive basis -- that is, through the port charge? (Pitts at 38.)

A. No. AT&T/WorldCom mis-categorizes the RTU costs in the same manner that they mis-categorize the "getting started," or processor, costs. RTU costs should be recovered on a cost causative basis, i.e. a user who utilizes a larger share of resources should be required to pay a

[22] MA Docket No's 96-73/74; 6-75; 96-80/81; 96-83; 96-94 Workpaper Part B, Page 92.

proportionally larger amount for those resources than a user that uses less of the resources.

The switch processor, like a computer processor, is virtually idle until the user invokes software. For switching, this equates to a phone going off hook. At that time the processor starts to establish the call, it evokes various stored programs to establish and maintain the call, including any particular features the caller may utilize on their particular line. Callers utilizing the processor also utilize the software necessary to run the processor.

AT&T/WorldCom's proposal that these costs be recovered through the monthly port charge would result in residential usage customers to subsidize the higher-usage business customers in Massachusetts. Their proposal to allocate the RTU costs to the port should be rejected.

H. Verizon MA's EF&I Factor Is Appropriate

Q AT&T/WorldCom (Pitts at 39-40) suggests that Verizon MA's EF&I factor for digital switches is higher than the factors used by other telephone companies. Do you agree with this claim?

A. No. AT&T/WorldCom provide no support for this claim. They also appear to not understand how EF&I factors are calculated. AT&T/WorldCom argue that Verizon MA's material investments for digital switches are too high. They ignore, however, the fact that there is an inverse relationship

between the material price of switches and the level of an EF&I factor. The lower the switch material cost, the higher the EF&I factor will be.

For example, suppose the cost to engineer and install a switch is $100, and the material price of the switch is $400. The EF&I factor would be 25%. If the material price of the switch dropped to $200, then the EF&I factor (in order to yield the correct amount of $100) would jump up to 50%.

AT&T/WorldCom's suggestion that Verizon MA use EF&I factors based on older data (ten years old) derived at a time when the material cost of digital switching investment was *higher* than in 1999 ignores this inverse relationship.

Q. AT&T/WorldCom suggest that a reasonable EF&I factor for digital switches would be 25%. What, if anything, is wrong with this calculation?

A. AT&T/WorldCom's proposed 25% EF&I factor uses EF&I factors based on entirely different switch investment calculations and seeks to simply apply them to totally unrelated switch investment amounts. As explained above and in the Initial Panel testimony, if the investment used in calculating an EF&I factor changes significantly, the EF&I would have to be restated in order to capture the actual EF&I expenses, because installation costs, for example, do not vary with investment amounts in a linear fashion. A door that costs 10% less than a different door will not necessarily cost 10% less to install -- indeed, the installation cost might not vary at all.

Ignoring this principle entirely, AT&T/WorldCom simply takes an average 8% factor based largely on a 1992 FCC filing, add in a 12% factor (plus sales tax) they calculate from the SCIS model, and arrive at a recommended 25% factor. They thus seek to combine a factor based on investment levels that are nearly ten years old with a factor based on current investment level -- and suggest that this could in some manner produce a meaningful forward looking "average" EF&I factor. Not only is the 1992 investment level no doubt entirely different from the level used as a SCIS input -- but, given its age, it is probably based on different plant, using older installation techniques. As noted above, although AT&T/WorldCom question whether Verizon MA's 1998 EF&I costs can still be relevant in 2001, they advocate using a factor based on data nearly 10 years old which *certainly* cannot be relevant. In sum, AT&T/WorldCom's basis for reducing the switch EF&I is insupportable and thus merits no consideration.

Q. AT&T/WorldCom (Pitts at 40) implies that because Verizon MA performs its own engineering and installation and does not put this work out for competitive bids, that Verizon MA is not efficient. Is she correct?

A. Absolutely not.[23] In Massachusetts, where Verizon performs its own engineering and installation work, it has every incentive to perform this

[23] *See* AT&T/WorldCom Response to Data Request VZ-ATT/WC 1-6.

work efficiently, since inefficiency would increase labor and other associated costs.

Moreover, Verizon does competitively bid this type of work to outside vendors in many of its other jurisdictions. Because Verizon's EF&I factors are based on all of the jurisdictions within the Verizon – East footprint, the EF&I factors reflect those competitively bid vendor jobs.

Q. Has AT&T provided any information in this proceeding relative to their own costs of installing switches in Massachusetts?

A. Yes. In its supplemental response to Data Request VZ-ATT 1-70, AT&T provided limited proprietary data related to the purchase and installation of a Massachusetts switch. While it was not completely responsive to Verizon's question, AT&T's data was nonetheless very telling. Depending on how the data is interpreted, the EF&I ratio associated with this switch would either be **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]**, exclusive of sales taxes that don't appear to be included. If 5% Massachusetts sales tax is added, the result is either **[BEGIN VERIZON PROPRIETARY] [END VERIZON PROPRIETARY]**. This data demonstrates that AT&T's own experience is comparable with Verizon's and certainly brings into question their recommendation of 25%.

I. Reciprocal Compensation

Q. AT&T/WorldCom claims Verizon MA is attempting minimize its cost of Reciprocal Compensation (Pitts at 43) by leaving the "getting started" costs and the RTUs out of the MOU Reciprocal Compensation cost. Can you comment on their claim?

A. Yes. Ms. Pitts completely ignores the Act[24] that specifies a state Commission can not consider Reciprocal Compensation rates to be just and reasonable unless:

i. Such terms and conditions provide for the mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier's network, facilities of calls that originate on the network facilities of the other carrier; and

ii. Such terms and conditions determine such costs on the basis of a reasonable approximation of the *additional costs* of terminating such calls.

The term "additional costs"" has a very significant impact on the cost development. Instead of looking at an increment bounded by no usage at one end and total usage on the other, as we do with UNEs, the additional cost standard tells us to look at an increment bounded on the upper end by all traffic and on the lower end by all traffic, less reciprocal compensation

[24] Telecommunications Act of 1996, Section 252(d)(2)(A).

traffic. This means that in the base case you have a fully functional and operating switch. You are then looking to identify what costs will be incurred as a result of offering more traffic to that already functioning switch. Since the switch is already functioning, there is no need to incur additional getting started costs or RTU costs. Therefore, Verizon MA's treatment of costs with respect to Reciprocal Compensation comports with the Act.

J. Verizon MA's Studies Use Correct Minutes-Of-Use

Q. Z-Tel Communications (Ford at 12) claims that Verizon MA understated the minutes-of-use in its switching study by excluding all weekend and holiday traffic in its conversion of investments into per minute terms. Can you comment on this claim?

A. Verizon's use of 251 days is correct and *will not* result in any over recovery of usage costs. The "busy hour" ("BH") is a specific hour during any given day when switching traffic (usage) is at its maximum. The switch must be designed to handle this "peak" traffic load. The amount of traffic during the BH is known as BH traffic. Traffic volumes on weekends and holidays are deliberately not included when determining BH traffic. The highest volume of traffic occurs during BHs on the weekdays. Traffic engineers design the switching network to accommodate the volume of traffic during the average BH. Since switch traffic is considerably less on weekends and holidays, adding these BH volumes into the weekday BH volumes would have the

net result of producing an overall lower average BH than the one that just includes weekdays. The end result would be that the switching network would be under-designed to handle the BH weekday traffic.

SCIS determines switching investments to meet the BH load, which are expressed in terms of "Busy Hour Investment." The goal is to express the BH investments as annual costs (or monthly) costs. This can be accomplished by using traffic volume ratios.

The first step is the computation of the ratio of the BH traffic volume to the all hours of the day ("AHD") traffic (AHD/BH). When this ratio is multiplied by the number of days the AHD traffic occurs in a given year, the result is a ratio of annual traffic to BH traffic.

Z-Tel criticizes Verizon's use of 251 days as the number of days the AHD traffic occurs in a given year. At first blush, it appears that Verizon is underestimating this number, which the parties claim increases costs. However, one must understand the data points used to develop the actual ratio.

Verizon MA's derivation of per-MOU local switch usage costs is set forth in Workpaper Part C-2, § 1, page 1 (the "Usage Worksheet"). The analysis starts with a total traffic sensitive investment for the switch (line 1); this in turn is divided by busy hour MOUs ("BHMOUs") (line 2) to arrive at an investment per BHMOU (line 3). The denominator of the fraction, the BHMOUs, is derived in Workpaper Part C-2, § 4, page 2. It is based on the

CCS loads handled by a typical line during the busy hour *of a business day*.

Various loadings are applied to the investment per BHMOU to derive an annual cost per BHMOU (Usage Workpaper, line 26). This is multiplied by a conversion factor that converts the annual cost per BHMOU to cost per MOU (line 27). The result of the multiplication is a cost per *total* MOUs, not just BHMOUs (line 28). After adjustments for non-conversation time, this becomes the proposed per-MOU rate.

The BHMOU to total MOU conversion factor is derived in Workpaper, Part C-3, § 3, page 7 (the "Conversion Factor Workpaper"). It is obtained by dividing the ratio of BHMOUs to total MOUs *in a typical business day*[25] by the number of *business days* in a year (251).

The consistent use of business day ("BD") data at each step in this analysis ensures an appropriate result, since all units were consistent.

Q. Z-Tel recommends replacing the number of business days per year (251) with 308, which represents total business days plus half of non-business days (weekends and weekday holidays). Can you comment.

A. Z-Tel's proposed adjustment incorrectly assumes that Verizon MA is suggesting that the total service (TS) cost should be spread only over business-day MOUs. But Verizon MA has not made such an assumption;

[25] This ratio was derived from NCAT data for a sample of business days.

Verizon MA assumes that the usage rate is based on the ratio of total TS cost to total billable MOUs, whenever those MOUs occur. The issue is how to properly calculate that ratio. In Verizon MA's analysis, since business day data was used in the numerator of the conversion factor, it was appropriate to restrict the denominator (including the number of days per year) to business days as well.

It is, of course, possible to modify the analysis to use the total number of days in the year (365) rather than just the number of business days. This, however, would have required countervailing adjustments to other parameters in the analysis. For example, the total number of BHMOUs would have to have been determined on the basis of an "average day" (*i.e.*, a blend of business day and weekend/holiday data) rather than purely on the basis of a "business day"; this would have decreased the number of BHMOUs. Since that number appears in the denominator of the overall analysis, such an adjustment would have increased the total cost. Similarly, the ratio of BHMOUs to total MOUs would have had to have been determined for an average day rather than a business day. Changing the number of days per year, as Z-Tel suggests, without making these other adjustments, results in an understatement of the per minute cost.

Q. You have indicated that you have re-run the switch cost studies and the revised results are attached. Can you summarize the revisions made to the switching cost study?

A. Yes. The following summarizes of the revisions made to the local switching cost study:

- In SCIS, there were three offices that were revised (due to mainly typographical errors in the original file). Athol remote was deleted (Athol is not a remote); GR-303 lines were added to Great Barrington; and GR-303, analog, and ISDN BRI lines were added to Watertown.
- IDLC and DS-1 port investments – the original study copied the wrong SCIS investments for these ports.
- Utilization Adjustment Factors were corrected to reflect the average number of lines/trunks per office; corrections were made to column J of the tandem utilization calculation; and the weighted technology for POTS utilization was corrected.
- Worksheet Part 2 & 3 – Digital trunk MOU midpoint was corrected; and 5ESS line termination investments corrected (SCIS A+C+D components).

VI. IOF

A. Verizon MA's Assumptions Regarding The Number Of Nodes Per SONET Ring Are Reasonable

Q. What is a node on a SONET ring?

A. A node represents a point at which transport circuits may enter and exit a SONET ring, and it is typically located at a wire center. Each node on a SONET ring contains a piece of electronics equipment called an add/drop

multiplexer (ADM), and the nodes on a ring are connected by fiber optic cables. Other types of equipment, such as digital cross-connect systems (DCS), are typically deployed at SONET nodes, as well. These systems facilitate the management of circuits entering and exiting the SONET rings. They also allow for more efficient interconnection between different SONET rings.

Q. Could you please explain how the number of nodes per SONET ring is relevant to the IOF study?

A. Verizon MA's IOF UNE rates consist of a fixed component, generally representing the cost of ADMs and other necessary electronics equipment at the SONET nodes, and a mileage-sensitive component, representing the costs of fiber cable, structures, and any line electronics (such as amplifiers). When calculating the fixed component of IOF UNE rates, Verizon MA used the number of nodes in a forward-looking SONET ring (6) to determine the investment for ADMs and other equipment at each node. When calculating the mileage-sensitive components of the IOF UNE rates, Verizon MA multiplied the average number of nodes on actual SONET rings deployed in Verizon MA's existing network by the average distance between nodes on these rings to determine the average length of a SONET ring.